

Contributions to American Lepidopterology.—No. 5.

BY BRACKENRIDGE CLEMENS, M. D.

PYRALIDÆ.—CRAMBITES.

CRAMEUS Fabricius.

C. agitatellus.—Head and thorax pale luteous; labial palpi somewhat fuscous, white beneath. Fore wings ochreous, tinted with orange, beneath the fold and toward the tip, with a broad silvery white median streak divided longitudinally by a chrome yellow line. The costa is dark fuscous from the base, and beyond the middle are two oblique fusco-luteous lines, the first of which is joined at an angle by another in the middle of the wing. On the middle of the apical third is a silvery white patch, another in the costa above it, a small one in the middle of hind margin, and one at the tip, margined internally by a small fuscous patch. Along the nervules, above and beneath the middle of the wing, are fuscous lines containing dull silvery scales, with a subterminal angulated silvery line, and a few marginal dots beneath the middle of the wing. Cilia silvery-hued. Hind wings whitish.

C. laqueatellus.—Head luteous. Thorax and labial palpi fuscous, the latter whitish beneath. Fore wings with two silvery white streaks, separated by a fuscous streak; the upper silvery streak is margined on the costa with fuscous, and the lower one, which extends beyond the apical third, is edged on the fold by the same hue. Beneath the fold, the wing is pale yellowish with a fuscous streak along submedian nervure. The apical portion of the wing is tinted with ochreous-yellow, in which the nervules are streaked with silvery; on the costa, near the tip, is an oblique silvery streak, dark margined on both sides. The subterminal silvery line is much angulated, and beneath the middle of the wing, is a large marginal whitish patch, containing black lines on the nervules. The tip of the wing is silvery, with an ochreous-yellow patch. Cilia silvery-hued. Hind wings pale fuscous, cilia white.

C. involutellus.—Labial palpi dark fuscous, whitish at the base beneath. Head and thorax dark yellowish with a brassy hue. Fore wings fusco-ochreous, with a brassy lustre, with a median silvery white streak pointed behind and extended nearly to the hind margin. The subterminal line is silvery, with a short white streak on each side of it on the costa. At the tip is a small white spot, and on the hinder margin beneath the middle is a whitish patch, containing marginal black dots. Cilia silvery-hued. Hind wings pale bluish white.

In some specimens the general hue of the fore wings is paler than the above.

C. camurellus. Labial palpi fuscous, whitish above. Head whitish. Fore wings rather pale, dull reddish fuscous or pale ochreous, dusted with fuscous, with an irregular patch of fuscous scales on the middle of the wing, where it is crossed by an angulated, rather ferruginous line, and one of the same hue near the hinder margin, edged externally by dull silvery. The nervules are faintly marked by silvery lines, and on the hind margin is a row of black dots. Cilia dark but silvery-hued. Hind wings grayish.

C. luteolellus.—Labial palpi pale yellowish, dusted externally with fuscous. Head, thorax and fore wings yellowish white, sometimes dusted with fuscous, with a patch of fuscous scales on the end of the disc, and an irregular line of the same hue near hinder margin. The hind margin marked by a slender dark brown line; cilia yellowish white. Hind wings fuscous, cilia whitish.

C. caliginosellus.—Head, thorax and labial palpi dark fuscous. Fore wings dark fuscous, with two angulated umber brown lines, one about the middle of the wing, and rather indistinct, and one near the hind margin; on the hinder margin is a blackish brown line; cilia fuscous. Hind wings rather dark fuscous; cilia whitish.

C. mutabilis.—Grayish fuscous, varied beneath the fold with luteous. Labial palpi dark fuscous. Fore wings with a grayish median stripe, not extending beyond the disk, more or less tinted with luteous beneath the fold, and with fuscous along the base of the costa. On the end of the median nervure is a dark brown dot, and sometimes streaked with dark fuscous beneath the nervure. The subterminal line is faint and bluish, usually containing a row of faint brownish dots. Hind wings yellowish, gray or pale fuscous.

This species appears to be highly variable, the general hue being sometimes pale ochreous, and in specimens somewhat worn, scarcely to be identified.

C. vulgivagellus.—Labial palpi luteous, dark fuscous externally. Head and thorax luteous; tegulæ with a fuscous stripe. Fore wings luteous, with numerous fuscous streaks in atoms, along the veins and two in the disk. Hind margin with a row of terminal black dots; cilia golden hued. Hind wings yellowish; cilia whitish.

C. albellus.—Pure white, with a row of black dots on the hind margin of the fore wings, with an oblique pale yellow acutely angulated line from near the middle of costa, and an angulated silvery subterminal line margined on both sides with pale yellowish. Above the marginal dots at the base of the cilia is a short blackish marginal line. Hind wings pale brownish-gray or whitish.

C. elegans.—Whitish. Fore wings at the base of costa rather broadly streaked with brown, having a brassy lustre, with a patch of brown scales on the inner margin near the base, and a short, curved streak of the same hue about its middle, which forms with its opposite when the wings are closed a semi-circular dorsal line, behind which the wing is dusted with brown. On the apical third of the wing is a broad, brown band, broadest on the costa, where it encloses a small white spot, and with a straight brown subterminal line exterior to it, on a silvery white ground. The hinder margin is dotted with black points; cilia silvery. Hind wings pale brownish white.

Variety. Costa slightly touched at the base with dark fuscous. No distinct broad band on the apical third, but the costa from nearly the middle, dark fuscous, containing two small, white costal spots. The subterminal line whitish, margined on each side with fuscous. The spot on middle of inner margin rather diffuse, not linear, and the wing behind it but little dusted. Hind wings whitish.

C. Girardellus.—Labial palpi pale fuscous externally, above and beneath silvery white. Fore wings silvery white, with an orange yellow stripe beneath the median nervure, somewhat turned upwards at its tip toward the apex of the wing, and extended on the sides of the thorax to the head; it is slightly margined toward the costa of the wing with dark reddish fuscous. The hind margin is dotted with blackish dots, and at the base of the cilia is a dark brown marginal line; cilia silvery. Head wings white.

Mass. From Dr. Chas. Girard.

C. auratellus.—Labial palpi and antennæ orange yellow, the former silvery white above. Fore wings silvery white, with an orange yellow band, from the apical third of the costa to the middle of inner margin, where it is broadest, and somewhat produced along the costa toward the tip, and the inner margin to the anal angle. Cilia orange yellow, with a dark reddish fuscous, somewhat crenated basal line. Head wings white.

Mass. From Mr. S. H. Scudder, Jr.

[June,

CHILO Zincken.

C. longirostrallus.—Labial palpi, head and thorax ochreous white. Fore wings pale yellowish-white, with a fuscous line from the tip to the inner margin. Hind wings pale ochreous white. Abdomen tufted at the tip.

C. melinellus.—Ochreous yellow. Fore wings with a pale fuscous streak along the middle of the fold, extended nearly to the tip, and a faint oblique line of the same hue, from the tip, not extended to the hind margin. Hind wings pale yellowish-white. Abdomen tufted.

C. aquilellus.—Dark fuscous. Fore wings with an ochreous streak along the submedian nervure and its nervules, and those beneath likewise touched with the same hue. Hind wings yellowish fuscous.

PHYCITES.

NEPHOPTERYX Hübner.

N. undulatella.—Labial palpi, head and thorax grayish fuscous. Fore wings grayish fuscous, with an angulated white line crossing the disk, sometimes obsolete above the fold, margined with dark brownish, and a subterminal line of the same hue dark margined on both sides. At the end of the disk is a short blackish transverse line, slightly margined exteriorly with whitish. Hinder margin tipped with blackish; cilia grayish fuscous. Hind wings grayish testaceous; cilia paler.

Penna., Canada and Mass. From Dr. Chas. Girard, Washington, D. C.

Early in October, I found pupæ of this insect at Niagara Falls, on the Canada side, under shelter of loosened portions of the bark of the American Elm. They were enclosed in a cocoon of silk, mixed with particles of bark. On the same tree I took a number of larvæ which were descending the trunk to undergo pupation. I did not, however, obtain imagos from any of the specimens. The body was nearly uniform in diameter, with the ordinary number of feet. Head as broad as the body and dark green. Body dark green, between the segments yellowish and dotted with yellow; first rings with two black dots on the sides.

N. ulmi-arrosorella.—*Female*. Grayish-fuscous. Fore wings with a slender, dark fuscous angulated line, edged on the costa internally by a pale grayish spot, and on the inner margin externally by another of the same hue. The subterminal line pale gray, dark margined internally. Hind wings pale brownish, darker on the margin.

The larva is found on the American elm in August. The head is pale brown, dotted with dark brown. The body dark green, with a dorsal, double line of pale green patches, and a slight subdorsal and stigmatal line of the same hue. On the 1st, 2d, 4th, 5th and 10th rings, are brown subdorsal points. It weaves a web on the surface of the leaves, feeding beneath it. The pupa is contained in a web between united leaves, in the vivarium. It becomes a pupa about the middle of August, and an imago about twelve or fourteen days after transformation.

PEMPELIA? Hübner.

Male. Labial palpi moderately long, scarcely exceeding the vertex; first and second joints thick, third extremely short and slender. Maxillary palpi with a short pencil of hairs. Tongue nearly as long as the thorax beneath: scaled at base.

P. virgatella.—Brownish luteous. Fore wings varied with pale grayish toward the base and tip, with dull pale reddish at the base and middle of inner margin; on the middle of the costa is a blackish blotch, containing a short line of the same hue, and opposite, an angulated whitish line, with few black spots exterior to the costal line; a blotch of the same hue towards the

1860.]

base of submedian nervure, and a pale grayish subterminal line margined internally by a blackish line, and externally by black streaks on the nervules. The internal black margin is edged on the costa and middle of the wing with pale grayish. Hinder margin spotted with black; cilia grayish fuscous. Hind wings pale brownish.

P. subcaesiella.—*Male*. Pale bluish gray, dusted with fuscous. Fore wings with a reddish luteous band at the base, broadest on the inner margin, and a rather broad, dark fuscous band on the basal third. The subterminal line is pale grayish, edged behind by dark fuscous. Hind wings pale brownish.

EPHESTIA ——— ?

E. ostrinella.—Reddish-purple varied with blackish. Fore wings with the basal third and the apical portion reddish purple, with a broad blackish band in the middle edged internally by a straight whitish line, and an exterior costal patch of the same hue containing two blackish dots on a short streak. The subterminal line is pale grayish. Hind wings pale brownish gray.

The larvæ lives in the fruit heads of Sumack, passing the winter in the larval state. It is dark reddish-brown, head brown; cervical and terminal shields blackish brown. The body is supplied with a few isolated hairs, and one or two rows of obscure dark brown subdorsal dots.

The larvæ make galleries through the fruit heads, and desert them in the spring, to form their cocoons, which are slight silken webs, and appear as imagos about the middle of April.

E. Zeae.—*Tinea Zeae*, Fitch, Rept. 2d, 321. Fore wings with the basal third pale ochreous-yellow or yellowish-white, and the remainder fuscous, with a reddish-luteous spot on the end of the disk, or dark grayish-fuscous varied with reddish luteous.

The larvæ is a frequent inhabitant of houses, and feeds on a variety of dry goods, rye, corn, clover seed, on garlic heads, preserves, especially those contained in jars. The seeds are bound together with a silken web in which galleries are left. It would be well if Dr. Fitch changed the specific name of this insect as corn is by no means its favorite or usual food.

The labial palpi of the imago are more decidedly porrected than in the foregoing species, but I do not think the difference between them is generic. I have no males of *Zeae* in my collection and do not know whether they have the tuft beneath the fore wing.

LANTHAPHE.

Male. The discoidal cell of the fore wings is narrow and appears to be unclosed. The costal and subcostal nervures run very close to each other, if not united, in the basal third of the wing; the former, from union with the first subcosto-marginal branch much thickened, or indistinctly furcate. The subcostal subdivides into two branches near the basal third of the wing, the upper one subdividing again in the middle of the wing, sending a branch with a *long fork* to the costa near the tip and a simple branch to the apex. The lower branch is thickened towards its origin, simple, and is the post-apical nervule. The median is thickened towards its end, and is four-branched. Hind wings neurulation pyraliform.

Head with ocelli. Eyes large and salient. Labial palpi ascending, applied closely to the front and with the tips much elevated above the vertex; first and second joints very short, first almost rudimental; the third very long, *folded longitudinally like a sheath*. Maxillary palpi rather short, with a pencil of very long, silky hairs, capable of being expanded, and *carried concealed in the sheath formed by the third joint of labial palpi*. Antennæ ciliated beneath; basal joint thick, with a short horn-like appendage behind having a tuft of hairs. Fore wings with a small discal vitreous spot, and the under surface from

[June,

the base of the costa to the middle, *thickly covered with long scales placed transversely.*

Female. Fore wings without discal vitreous spot. Discoidal cell closed by an arcuate nervure; with costal and subcostal nervures distinct, the latter with a single marginal branch from the cell, and at the apical third of the wing subdividing into an apical and marginal branch, which is furcate; the subcosto post-apical from the superior angle of the cell. Submedian four branched.

With ocelli. Labial palpi ascending, with tips but little elevated above the vertex; nearly cylindrical; second joint somewhat thickened and long, extending above the eyes; the third short, slender and pointed. Maxillary short, without pencil of hairs. Antennæ simple and setaceous: basal joint thick, without appendage behind.

The tongue in both sexes is scaled at the base, and moderately long; and the fore wings with distinct strigæ and tufts of scales.

This genus appears to be congeneric with *Acrobasis* of Zeller.

L. platanella.—Labial palpi pale brownish-red, touched in front with pale gray. Head and thorax brownish-red, the latter varied with grayish and dark fuscous. Fore wings grayish fuscous, with the costa touched with brownish red, and a patch of the same hue in the female, near the base of the inner margin containing a tuft of raised scales; in the male, blackish brown, touched with brownish red. The base of the wing is whitish. In the middle of the wing is a broad white band, obsolete toward the costa, with two straight blackish-brown lines internally, and in the male shaded internally with the same hue. The subterminal line is irregular and whitish, dark margined internally. The hinder margin of the wing is touched with blackish-brown. Hind wings pale brown, somewhat darker toward the hinder margin.

The larvæ is tortriciform in appearance. Head pale brown, mottled with whitish. Body with isolated hairs, pale green, with a dark brown dorsal line and a fainter stigmatal line of the same hue, or pale reddish, with a brown dorsal line on each side of the vascular.

It makes a web on the under surface of the leaf of Sycamore, (*Platanus occidentalis*), drawing it together and living within a silken tube.

The cocoon is woven on the surface of the ground, in form of a flattened oval, consisting of brown silk covered exteriorly with grains of earth. The larvæ remain in it unchanged during the winter. It may be taken in July, and enters the pupa state during the latter part of August, to appear as an imago in May or June.

L. asperatella.—Labial palpi blackish brown, varied with whitish. Thorax pale grayish, varied with grayish or dark gray. Fore wings dark brownish-gray, with a blackish brown tuft of scales in the basal part of the fold, and a smaller one of the same hue on the disk above it, a whitish median band, sometimes almost obsolete, containing on the disk a small blackish-brown tuft in the female, with an internal crenated blackish line, and shaded toward the base with blackish; on its external margin is a line of raised scales. The subterminal line is pale grayish, angulated and margined internally by a blackish line, and externally by a fainter one produced into points on the nervules. The hinder marginal line is black. Sometimes in the female the base of the wing is whitish, slightly touched with luteous.

Penna. and Mass. From Dr. Chas. Girard.

TINEINA.

LITHOCOLLETIS. (See Paper No. 2.)

L. Fitchella.—*Argyromiges quercifoliella*, Fitch, Report v., Section 327. Head, face and thorax silvery white. Labial palpi tipped with pale ochreous. Antennæ pale saffron; basal joint silvery white. Fore wings pale 1860.]

reddish-saffron, with a slight brassy hue. Along the costa are *five silvery white costal streaks*, all black margined internally except the first, which is very oblique and continued along the costa to the base of the wing. All the costal streaks are short, except the first. On the inner margin are *two conspicuous silvery dorsal streaks*, dark margined internally, the *first, very large*, and placed near the middle of the inner margin, the second opposite the third costal streak. At the tip is a small, round black spot, placed above the middle of the wing; cilia silvery gray, tinted with saffron. Hind wings grayish-fuscon, cilia paler.

The specific name used by Dr. Fitch being already in use to designate a European species of this genus, it was necessary to change it. I feel pleasure, therefore, in dedicating it to the industrious observer who first described it, and who is adding so much to our knowledge of entomological Natural History.

L. tubiferella.—Head silvery white. Antennæ fuscous, slightly annulated with white; basal joint pale saffron. Fore wings pale saffron, with two silvery white, moderately broad bands, black margined externally, one near the base and the other on the middle of the wing, and both somewhat oblique; cilia of the general hue. Hind wings dark grayish, cilia the same.

The larva belongs to the second larval group of this genus, but the body much more contracted than that of any other larva I have seen. Its form is almost that of a flattened ovoid, the rings separated by deep incisions, and each forming in the sides a projecting mammilla.

The larva mines the upper surface of the leaves of oaks in September, and doubtless also in the summer months. The mine is a linear tract, sometimes curved or wavy, gradually increasing in breadth from the beginning to the end, or as the larva increases in length, with the "frass" deposited on each side of the tract and marking its outlines by two black lines. The position of the larva within the mine is likewise a peculiar one, as it is always placed transversely to its course, and hence the deposition of the "frass" on the sides, and the gradual increase in breadth as the larva grows in length. Its head is blackish brown; the body pale greenish, with pale brown dorsal maculæ, darker on their edges. It undergoes transformation in the end of the mine, preparing a circular cell or slightly silk-lined cavity, and leaves the last larval cast outside of it. The fall brood of larva become imago about the middle of May.

L. cratægella.—This insect is found on the apple and wild cherry, (*P. serotina*), without undergoing any variation, which I can detect. I thought beyond doubt, that that in the leaf of wild cherry, must be a distinct species, for the larva has a habit unusual to larvæ of this group, and which I have not noticed in those on the thorn and apple, although, doubtless, they correspond. The habit I refer to in wild cherry miners, consists in *deserting an old mine to form a new one*, reminding one strongly of the early habits of the *Ornix* larvæ. The larva enters along the midrib to form a new mine, which I have found in various stages of advancement, besides the old and tenantless mine in another portion of the leaf.

TISCHERIA. (See Paper No. 2.)

T. malifoliella.—Head and antennæ shining dark brown; face ochreous. Fore wings uniform, shining dark brown with a purplish tinge, slightly dusted with pale ochreous; cilia of the general hue. Hind wings dark gray; cilia with a rufous tinge.

The larva mines the upper surface of the apple leaf. The mine is flat, at least until the larva enters the pupa state, and begins as a slender *white line*, dilating as it increases, and is ultimately formed into an irregular brownish colored patch, which is sometimes extended over the beginning. This is then shown on the separated epidermis as a white line or streak. The head of the

[June,

larva is brown; the body uniform pale green; first segment brownish, with a short, vascular greenish streak. When the pupation begins the leaf is thrown into a fold, which is carpeted with silk, and the pupa lies within it. This state begins about the latter part of September, and the imago appears early in May.

ANTISPILA. (See Paper No. 3.)

A. Isabella.—Head golden. Antennæ purplish brown. Fore wings *purplish brown, without violet and greenish reflections*, with a pale golden band near the base, inclined toward the base, not constricted on the fold, but broadest on the inner margin. Near the tip of the wing is a small pale golden costal spot, and one of the same hue nearly opposite on the inner margin. The hind wings have a *greenish reflection*; in *Nyssæfoliella*, they are rather deep purple.

The larva mines the leaf of *Isabella* grape in September. Its head is brown; the body yellowish white, with a few black dorsal spots on a dark green ground, on the middle segments and beneath a spot on the fourth and fifth segments: first segment dark green. It cuts out a very large, nearly round disk, during the latter part of September, and appears as an imago in the latter part of May.

A. viticordifoliella.—The larva mines the leaves of wild grapes. Its head is brown; the body yellowish green, without dorsal or ventral spots; the first ring brown. It may be taken in August, and in the beginning of September it cuts out a small oval disk and enters the pupa state. I have not succeeded in breeding the imago, but have no doubt it is specifically distinct from any heretofore described.

ASPIDISCA.

(See Proceedings, Jan'y., 1860, p. 11.)

The diagnosis of this genus was made from two specimens of *A. splendorifera*. In insects so extremely small and fragile, even when relaxed by moisture, it is no simple task to make a correct diagnosis from a single examination. The reader will therefore please correct in the January number of the Proceedings as follows: *Labial palpi extremely short and slender, much separated. Tongue naked and scarcely as long as the anterior coxæ.*

A. luciflua.—Head silvery. Antennæ rather dark fuscous. Fore wings silvery from the base to the middle, and thence to the tip dark fuscous varied with golden. Near the tip are *three short, costal silvery streaks* adjacent to each other; the first is longer than the others, with converging dark margins, and a *golden patch* on its internal side; the second with straight dark margins, and a golden patch beneath and adjoining it; the third is unmarginated except by the external margin of the second streak which separates them. Opposite the first costal streak is a dorsal, tapering streak of the same hue, and placed in the dark fuscous portion of the wing. From the second golden spot to the middle of the hinder margin is an oblique silvery streak, sometimes separated into two spots. At the extreme apex is a deep black triangular spot; the cilia grayish, tinged with pale brownish.

The larva may be found in September and October mining the leaves of hickories. The head, first and second segments are brownish, with a reddish tinge; body brownish-green, with a dark green vascular line and three blackish dorsal spots on the middle segments. Early in October the larva cuts out an oval disk and enters the pupa state, to appear as an imago early in June. The perfect insect is larger than *splendorifera*.

PARECTOPA.

The fore wings are lanceolate. The disk is acutely closed behind, at the apical third of the wing and narrow. *No costal nervure*. The subcostal sends
1860.]

off quite near the base of the wing a long marginal branch, and near its end, two other branches to the costa. From the acute apex of the disk arises the apical branch, which, near its origin sends a branch to the costa, and about its middle becomes bifid, sending one branch to the costa near the tip, and the other to the inner margin beneath it. The median is *three-branched*, the posterior vein arising somewhat interiorly to the costal origin of the second marginal, and is most distinct on the inner margin, being faintly indicated from its middle to its origin.

Hind wings very narrow, almost setiform. The disk unclosed. The costal nerve is well indicated and long, reaching almost to the tip of the wing. The subcostal is furcate beyond the middle of the wing and is attenuated toward the base almost from its bifurcation; it runs close to the costal trunk. The median nerve is furcate within the middle of the wing, on the inner margin.

Head with long, loose scales above, forming a slight tuft between the antennæ. Forehead rounded. Face narrow and short, somewhat retreating and smooth. No ocelli. Eyes small, round, salient and naked. Labial palpi moderately long, slender, smooth, pointed and drooping, (in the living insect most probably ascending); second joint slightly thickened at its end. Maxillary palpi not perceptible. Antennæ inserted on the front; filiform and simple; basal joint scarcely thicker than the stalk and short; nearly as long as the fore wings. Tongue naked, slender, nearly as long as the thorax beneath.

P. lespedezaefoliella.—Head and face white. Labial palpi, second joint dark fuscous, the third white. Antennæ dark grayish fuscous. Thorax blackish brown. Fore wings blackish brown, with three silvery white spots along the inner margin, one almost at the base of the wing, one at the apical third, and the other intermediate between them. On the costa are two silvery white spots, the first a little exterior to the second dorsal; the second costal opposite the third dorsal. Along the hinder margin is a black hinder marginal line, or two decided converging black streaks, one from the costa and the other from the inner margin, meeting at the tip where there is a small silvery white spot. The cilia along the *hinder margin are silvery white tipped with blackish*, and along the inner margin dark gray. Hind wings dark fuscous, cilia the same.

The larva mines the leaves of bush-clover, (*Lespedeza violacea*) early in September. It makes a whitish blotch mine, with a number of narrow, lateral mines, or rather wide galleries running out from it, on the upper surface of the leaf. The blotch is chiefly in the middle of the leaf, the larva mining along the midrib in the first instance, and when disturbed it conceals itself by retreating to the midrib, and applies itself along the course of it. Hence tenanted mines may easily be mistaken for deserted ones. The mine never contains "frass," and the larva seems to leave one capriciously, whilst it is yet small in extent, to form a new one; this it does by penetrating the under cuticle of the leaf. In the course of larval life, many new mines are formed and the insect is a troublesome one to breed. The larva is cylindrical, slightly tapering from the first segment, and the body bright, concolorous green. It deserts its food-plant about the middle of September to form its cocoonet; this is woven upon some substance on the ground, in the vivarium, in a pucker on a leaf, or under a turned-down portion of the edge, and is white. It appears as an imago early in May.

I have no good description of this larva in my notes, but have of another having precisely similar habits, and in appearance very like it. It mines a species of *Desmodium* plants, nearly related to *Lespedeza*, and is probably the same insect, or at least of the same genus as the above. The body of this larva tapers posteriorly; it is submoniliform and slightly flattened, with the segments roundly mammillated on the sides. The feet are three, the abdominal three and the terminal one pair. The head is pale brown; the body

[June,

bright green, tinged with yellowish. The larvæ desert their mines to form new ones, hence they are never extensive, sometimes blotches, and again irregular galleries along the midrib, with lateral branches. The "frass" is voided at the entrance opening beneath. I was not successful in breeding the larvæ on *Desmodium*.

BUCCULATRIX Zeller.

(See Paper No. 3, Proceedings, Jan., 1860. The authority there given is a mistake.)

B. pomifoliella.—Head and face very pale ochreous, with the tuft tipped with brownish. Antennæ pale ochreous, dotted above with dark fuscous. Fore wings whitish, tinged with pale yellowish, freely dusted with brown. On the middle of inner margin is a large dark brown, oval patch, forming, with its opposite when the wings are closed, a conspicuous, nearly round dorsal patch; a streak of the same hue, from the costa opposite it, running to the inner angle of the wing and tapering from the costa where it is broadest. At the tip is a round, dark brown apical spot, and in the cilia a dark brown hinder marginal line. Hind wings pale brownish ochreous, cilia the same.

The larva feeds externally on the leaf of apple, at least at the time it was taken, in the latter part of September. It is cylindrical and submoniliform; tapers anteriorly and posteriorly; with punctiform points and isolated hairs, first segment with rather abundant dorsal hairs; thoracic feet three, abdominal four and very short, terminal one pair. Head small, ellipsoidal, brown; body dark yellowish green, tinged with reddish anteriorly; hairs blackish and short.

Early in October the larva enters the pupa state, weaving an elongated, dirty white, ribbed cocoon, and appears as in imago during the latter part of the following April or early in May.

B. agnella.—Head and face sordid white, the latter touched with fuscous. Antennæ dark fuscous. Fore wings whitish, washed with pale luteous-brown, which prevails especially towards the tip and along the fold. About the middle of inner margin, on the fold, is a small dark fuscous mark, consisting of a few scales. *The costa is dark fuscous from the base*, and about the middle of the wing gives off a short oblique streak of the same hue, and another near the apical third, which is fuscous near the costa and pale luteous-brown beyond it, and margined exteriorly with white, especially on the costa. The long scales in the cilia are tipped with dark brown. Hind wings brownish, cilia brownish with a rufous tinge.

Taken on wing about the middle of May.

MACHIMIA.

Fore wings with the hind margin obliquely pointed. The subcostal nervure gives off a marginal branch near the basal third, and at the end of the disk subdivides into four nervules, of which the apical is furcate near the tip. The median is four-branched, the medio-posterior remote from the penultimate. The submedian is furcate at the base. In the disk is a long, faintly indicated secondary cell. The neuration of the hind wings like that of *Depressaria*. The discal nervure is oblique. The interior basal angle rounded, and the margin slightly excised behind it.

Head and forehead between the antennæ, *shaggy*. Face rather smooth, depressed and retreating. No ocelli. Eyes small, oval and salient. Labial palpi rather long, remote from the face, slender, curved and ascending; *second joint roughened with scales*; the third smooth, aciculate, and about one-third less long than the second. Maxillary palpi very short. Antennæ about one-half as long as the fore wing, simple and filiform; basal joint short. Tongue scaled, about as long as the anterior coxæ.

1860.]

M. tentoriferella.—Labial palpi pale yellowish; basal half of the second joint blackish or dark fuscous. Fore wings reddish ochreous, with dispersed dark fuscous atoms. The extreme base of the costa is blackish, from a small black spot on its edge; with three blackish brown spots arranged in a triangle in the middle of the wing, one about the middle of the disk, another on its end, and one in the fold beneath them; cilia rather long and russet colored. Hind wings rufo-fuscous, along the discal portion of costa, pale ochreous.

The larva tapers posteriorly from the head; terminal legs short, placed posteriorly, projecting beyond the shield; abdominal legs short; with papiliform points in squares, each bearing a hair; body cylindric and sub-moniliform. The head is large, carried horizontally; somewhat flattened above, but rounded; cervical shield doubtfully indicated, its color dark green. Body dark green, at first uniform, but after the last moult, a double yellowish-green dorsal line is added.

It may be found during the latter part of July, on the leaves of wild cherry, oaks and hickories. On the underside of the leaf it throws a closely woven sheet or web from the midrib to the side of the leaf, and draws it into a shallow fold. This sheet or tent is not much longer than the larva itself, open at both ends, transparent, shining and vitreous. Beneath this it rests during the day, and in the night leaves it to feed on the edges of the leaf, retreating to its cover if alarmed. To this it clings most tenaciously if disturbed, thrusting its head from beneath it, shaking it from side to side, or if disturbed in front, retreats, without leaving it, and defends itself stoutly with its mandibles. Its length is about half an inch. When it leaves a leaf to form a new tent on another, it always devours the silk of the one it deserts.

During the latter part of August or first of September it enters the pupa state and forms its cocoon, by turning down a portion of a leaf, carpeting it with silk and binding its edges closely. The opening left at the ends, corresponding to the tail of the pupa, is closed densely, and the other with loose silken threads. The pupa case is very dark reddish brown, and it remains in situ when the imago escapes. The antennæ-cases as long as the wing-cases; abdomen rather short and blunt; cylindrico-conical. The imago appears during the latter part of September.

PSILOCORISIS.

The neuration of the wings differs in scarcely any respect from the foregoing genus, except that the medio-posterior vein *is not remote from the penultimate*. The posterior veins of the median are very much curved. The structure of the fore wings in both these groups is much like that in the Tortrices.

Head smooth. Face rounded. Ocelli none. Eyes large, round and salient.

Labial palpi long, remote from the face, recurved, rather slender; second joint rather flattened, *smooth, with appressed scales*; third smooth, slender and pointed, nearly as long as the second joint. Maxillary palpi short, distinct. Antennæ about one half as long as the fore wings, simple and filiform; basal joint rather long and subclavate. Tongue one-half as long as thorax beneath, scaled.

P. quercicella.—Head and thorax dark yellowish-brown. Labial palpi, second joint ochreous, with a black line on the edge beneath; third black, with two yellowish white stripes in front. Antennæ ochreous, with a black line above, terminating in black spots; basal joint with two black stripes in front. Fore wings yellowish brown, varied with blackish irregular striæ, chiefly from the costa, with a black dot on the end of the disk. The posterior margin is tipped with blackish; the cilia are yellowish brown, containing two dark fuscous hinder marginal lines. Posterior wings pale ochreous, cilia the same.

The larva tapers from the third segment anteriorly and posteriorly; flattened

[June

above and beneath, submoniliform; no dorsal papilliform points, but two rows on the sides; abdominal and terminal feet very short, the latter placed posteriorly. Head small, cordate, horizontal. The body is yellowish or pale greenish, the head, 1st, 2d, and 3d segments black.

It binds the leaves of oaks together, in August and September, and picks out the parenchyma between the network of veins. In the latter part of September it weaves a slight cocoon between two leaves, (in nature it is probably made elsewhere than between the leaves of its food plant), and becomes a rather short, thick pupa, with the antennæ cases moniliform and longer than the wing-cases, beyond the end of which they project as an obtuse spine. It appears as an imago in March or April.

Labial palpi very long and recurved, the tips extending back as far as prothorax, but remote from the face and head.

P. reflexella.—Head brownish, tinged with ferruginous. Labial palpi dark ochreous, with a black line on the edge of second joint beneath, and three black lines on the third, one in front and one on each side. Antennæ dark ochreous, annulated with dark fuscous; basal joint with two black stripes in front. Fore wings dull ochreous, profusely dusted with reddish fuscous; cilia short and dark colored. Hind wings fuscous.

This species very closely resembles, physically, *M. tentoriferella*. The labial palpi are longer, however, more recurved, and the second joint perfectly smooth, whilst in *tentoriferella* it is roughened with scales.

Both these genera likewise closely approach the European genus *Phibolocera*, and it is not impossible that one of them may be really identical with it, notwithstanding the longer antennæ and shorter third joint of the labial palpi in the European species.

MENESTA.

Fore wings obtusely pointed above the middle, elongate-ovate. Disk closed by a very faint nervure. The subcostal subdivides into five nervules, the first of which is from the middle of the disk, the fourth being the apical, and the fifth the post apical from the middle of the disk behind. The median is three-branched, the medio-posterior being opposite the third subcostal vein. The fold is thickened at its end and runs into the basal third of the median. The submedian curved, and shortly furcate at the base.

Hind wings somewhat trapezoidal, slightly emarginate on the hind margin beneath the tip. The discoidal cell unclosed. The costal nervure is long and extended nearly to the tip. The subcostal somewhat attenuated at its base, distinct from the costal, and furcate at the apical third of the wing. The median three-branched, the superior and central veins on a common stalk.

Size small. Head and face smooth, minutely scaled. Forehead and face rounded and very broad. Ocelli none. Eyes vertically placed, minute, oval, salient. Labial palpi smooth, slender, curved and ascending equal to the vertex; second joint slightly thickened towards its end; third very slender, pointed, and not more than one-half as long as the second. Maxillary palpi very short, distinct. Antennæ much separated at their base, about one-half as long as the fore wings, filiform and ciliated beneath microscopically, *with one hair to each article*; basal joint very short, scarcely thicker than the stalk. Tongue scaled at the base, slender, and about as long as the anterior coxæ.

M. tortriciformella.—Labial palpi fuscous, towards the base whitish. Head, antennæ, and face dark luteo-fuscous, the latter whitish beneath. Fore wings dark brownish with a purplish hue, with a small lunate white spot on the end of the disk. Hind wings dark fuscous, cilia the same. Feet pale yellowish, the ends of middle and posterior tibiæ touched with fuscous; the middle tarsi fuscous externally, and the hind tarsi banded with fuscous at the base.

NEPTICULA Zeller.

N. rubifoliella.—Head dark luteous. Palpi somewhat paler luteous. Antennæ luteous, basal joint silvery white. Fore wings blackish-brown, with a rather narrow, curved silvery band about the middle of the wing. The band is concave toward the base of the wing, and shows a tendency to be interrupted in the middle. Cilia whitish. Hind wings grayish, cilia the same.

I have very carefully compared this insect with the description and delineation of *N. angulifasciella*, of Stainton, in the first volume of the *Nat. Hist. of the Tineina*, and though unwilling to believe the fact, I cannot resist the conclusion, that it is the same species. I have not named the species in accordance with this conviction, because as yet I have secured but a single specimen.

The larva mines the leaf of blackberry in September. It makes a blotch mine on the upper surface of the leaf, beginning as a slender gallery, extending quite a distance, usually along a vein of the leaf, before being enlarged into a blotch. The body of the larva tapers posteriorly, the terminal rings being attenuated; color pale green, with a bright dark green vascular line; head greenish-brown and small. The larva was not taken from the mine for description. It leaves the mine very early in October to spin an oval, very dark reddish brown cocoon, and appears as an imago during the latter part of May or early in June. There is, therefore, in all probability, a summer brood, which may be found in July and August, if the conjecture is correct.

I have no doubt that subsequent observation will prove this insect to be the same as *angulifasciella*, and I am no little astonished to find so minute a creature common to the continents of Europe and America. During the coming season I will endeavor to record minutely the history of the preparatory states of the American species.

PHALENITES.

DORYODES Guenée.

I would notice this genus here merely to express my ideas respecting its classification. M. Guenée says of it, that the insects belonging to it have so doubtful an aspect that he is uncertain not only in what family, but in what division to place it. He notices its superficial resemblance to Crambus, or Chilo, and to the genera *Senta* and *Meliana* of his division Noctuelites, but says that from the form of antennæ and labial palpi, the absence of ocelli, (herein, however, M. Guenée is in error, for they are *not* absent), and from some other characters, not designated, it cannot be mistaken for one of the Noctuelites. While acknowledging the very notable differences between this genus and those with which it is associated, he does not inform us what ruling considerations induced him to prefer for it a place in his division Phalenites, (Geometrina) and the family Ligidæ.

In my own view, this genus has few or no structural characteristics of the Geometrina, and its neurulation just as undoubtedly places it in Guenée's group Noctuelites, (Noctnina); this, too, is a position justified by its general structure. If the subpectinated antennæ of the ♂, and the comparatively slender body, are considerations sufficient to overrule the position of the wings in repose, the partial folding of the hinder pair, the structure of the legs, *the presence of ocelli*, and the purely noctuiform neurulation, then indeed does the lesser amount of evidence overbalance the greater. Had M. Guenée not overlooked the presence of ocelli, his decision might have been different, for these organs are always absent in the Phalenites, and the possession of geometriform antennæ is not enough to neutralize their presence or to determine the place of the genus.

In the hope that some of the entomological students of New England, where one of the species of this genus certainly is found, may be able to make out

[June,

its larval history, I will describe the species in my collection, and extract M. Guenée's description of the other. The first species may be easily recognised by means of Guenée's very good figure, and as a generic diagnosis would not facilitate recognition, particularly without the means of reducing it from a general to a special group, I will omit any generic description.

D. acutaria.—Herr. Sch. Sup., p. 74, f. 447. *Guenée Uranides and Phalénites, Suites à Buffon*, x. 233, pl. 17, f. 6.

The appearance of the imago is somewhat crambiform. The fore wings pale ochreous, tinted with dark luteous (with clear grayish violet, *Gn.*) along subcostal nervure and its marginal branches, and with a rather broad blackish streak beneath the median nervure, extended from the base and curving behind upwards toward the tip, bordered on the costal side by a silvery line, and one of the same hue behind, along the curved portion. In the disk are two blackish dots, one on the discal nervure and the other about the middle of the disk. Hind wings ochreous white. *Guenée's* sp. from Ga.; mine from Mass. Col. of Dr. Chas. Girard.

D. spadaria.—*Gn.* x. p. 234. "Very near the preceding, but larger, with the wings more oblong. The superior wings are more acute, and the terminal border perfectly straight. Their color is darker, grayer, with the designs finer and less distinct. The inferior are more developed and more oblong; they have the internal angle and part of the side tinted with blackish gray. The abdomen is perceptibly longer, and the antennæ also proportionably longer and slenderer."

In his generic diagnosis, M. Guenée says of the abdomen, "*dépassant beaucoup les ailes inférieures*," whereas in my specimens of *acutaria*, the abdomen exactly equals the length of the hind wings, when the wings are folded. He refers, doubtless, to the expanded wings.

PYRALIDÆ.

DESMIA Westwood.

This is one of the few genera in M. Guenée's family Asopidæ, of his division Pyralites, the *males* in which are characterized by nodosities or curvatures of the antennæ. As Guenée, at the time of writing his volume on *Deltoïdes* and *Pyralites*, had not seen the males of this genus, and his description, in the general remarks on the genus, does not accurately represent their structure, I will describe these organs in the male, of which I have several specimens. In noticing the singular conformation of the male antennæ, he says: "*sont d'abord renflées en massue, puis étranglées et munies d'un gros article ovoïde, puis enfin grêles et ciliées jusqu'au sommet.*"

About the middle of the antennal stalk, is placed a transverse, nearly vertical plate, which on the external side has a triangular elevation, and adjoining this, toward the base, is a narrow tuft of obliquely placed scales, running along the upper surface of the stalk. Toward the apex of the organ, immediately following this protuberance, one-half of the stalk is excised from above and slightly tufted internally. There is no thickening of the stalk except at the protuberance, and beneath it is microscopically pubescent from the base to the tip.

D. maculalis.—West. Mag. Zool., 1831, pl. 2, Guenée, vol. viii. 189. Blackish brown. Labial palpi blackish brown, while beneath. Fore wings with an irregularly oval white spot placed partly on the middle of the disk, the median nervure and the fold; another of the same hue and nearly round, on the base of the nervules behind the disk. Hind wings with a single, discal white spot. Abdomen with a white band at the base, a dorsal spot on the middle, and a short white dorsal streak at the tip.

Mass. and Ill. Col. of Messrs. Scudder and Kennicott.

EUSTALES.

Fore wings with two subcosto-marginal nervules, given off very near the posterior-superior angle of the disk, the stalk of the second almost in contact with that of the apical branch near their origins. The apical and post-apical arise together at the angle of the disk, the former being furcate near the tip, sending a nervulet to near the costa. The disco-central is given off from the middle of the discal. Median four-branched, the medio-superior on an extremely short, vertical peduncle; the posterior arising at a point somewhat behind the costal origin of the first marginal branch.

In the hind wings the costal nervure is furcate at the tip of the wing; the oblique intercostal branch is long and exterior to the cell, and the subcostal simple and attenuated at the base. The median four-branched, the superior which continues the curved discal nervure, almost in actual contact with the following branch. The hind wings are broader than the fore wings, and about one-fourth less long.

Head with ocelli, rather remote from the eyes; face rounded, smooth, and rather narrow. Eyes large, round and prominent. Labial palpi rather thick, curved and ascending to about the middle of the face; second joint thickened beneath with scales; the third rather smooth, elongate ovoid, and about one-half as long as the second. Maxillary palpi rather long, curved and ascending, their tips nearly equal to those of the labial palpi, roughened with scales, distinctly three-jointed. Antennæ about as long as the body, with triangular patches of shining scales along the stalk above; inserted above the middle of the eyes, with bases contiguous and microscopically pubescent beneath. Tongue scaled at base and when unrolled, does not extend beyond the tips of the labial palpi. No abdominal apron (*tablier*) perceptible. The posterior coxæ rather short; the length of the tibiæ and tarsus, of the hind pair of legs, equal to that of the entire body.

E. Tedyuscongalis.—Fore wings ochreous yellow, paler along the costa, dusted somewhat with reddish fuscous, with a moderately broad white band from the costa near the tip, curving toward the base of the wing in the *submedian interspace*, where it becomes rather broader, to the middle of the inner margin. Behind this, near and parallel to the hind border, is a narrow white band, not extended to the costa nor inner margin, and bordered exteriorly with a blackish-brown line. The exterior border of the wing is paler yellow than the general hue. Hind wings white, with an oblique fuscous band above the middle, tapering to the external margin; a broad one of the same hue near the hinder margin, having a pale ochreous-yellow spot at each end, and margined behind with a white streak having an external delicate black line. The terminal margin pale ochreous-yellow, with four black points having ochreous-yellow pupils, arranged along the margin from the middle of the wing toward the exterior angle.

Lake Teedyuscong, Pike county, Penna., in the latter part of June or early in July.

The ornamentation of this insect resembles in a remarkable degree that of *Oligostigma juncealis* Gu.; it cannot, however, be a member of the same genus.

HYDROCAMPA? Latreille.

Guenée, vol. viii. 273.

Fore wings with one subcosto-marginal from near the superior angle of the disk; the apical branch, at its basal third, gives off a branch to the costa, and somewhat behind its apical third becomes furcate; the post-apical arises at the angle, and the discal nervule on the costal side of the cell. Median four-branched; the superior on a very noticeable peduncle; the posterior remote from the penultimate, which together with the other branches are aggregated at their bases.

[June,

In the hind wings the costal nervure has a rather long fork. The intercostal branch exterior to the cell and extremely short, and from this point posteriorly the stalks of the two nervures are almost in contact. The median nervure four-branched, the superior on a moderate peduncle.

The structural differences between this and the foregoing genus are: the labial palpi slenderer; third joint very short, about one-third as long as the second, which is squamous beneath. Maxillary palpi slender, smooth, porrected; with tips equal to the end of the second joint. Tongue scaled at the base, *at least one-half as long as the body*. The length of the middle tibiæ and tarsus equal to that of the body; the hind tibiæ and tarsus exceeding the length of the body.

H. ? formosalis.—Fore wings pale yellow, with three white patches on the disk, the two nearest the base small and slightly margined with fuscous, the one on the end of the disk margined internally by an oblique fuscous line; a white patch on the nervules behind the disk, margined externally by a fuscous line convex toward the base of the wing and hooked at each end, with a white patch at the tip and one beneath it at the inner angle, both margined externally by a submarginal curved fuscous line. In the middle of the *submedian interspace* is a nearly oval white patch encircled with fuscous. Hind wings white, pale yellowish beyond the middle, with a fuscous line near the base from the inner margin, not extended to the costa; a wavy double line of the same hue rather external to the middle, and a white spot near the tip and one about the middle of the hinder margin, both margined externally with a fuscous line. On the disk is a pale yellowish spot.

Lake Teedyuscong. Imago, July.

CATACLYSTA Herrich-Schaffer.

Fore wings with the first subcosto-marginal vein and medio-posterior opposite at their origins. The apical vein runs into the costa before the tip, and gives rise to a marginal branch at its basal and apical third. The post-apical runs into the produced tip of the wing and gives origin to the discal nervure. Hind wings, the costal is shortly forked near the tip. The subcostal arises from the costal within the disk *and is not produced toward the base. The median is three-branched*. Head without ocelli. Antennæ of the ♂ densely pubescent. Tongue as long as the thorax beneath.

The structure of the posterior wings in the species described below forms very nearly a parallel case to *C. dilucidalis* described by M. Guenée. The costal nervure of *dilucidalis* is not, however, represented bifid, and the branch which corresponds to the costal nervure does not arise within the cell and give origin to the discal, but exterior to the disk and the discal nervure arises behind it from the costal. They both concur in the absence of the discal, or independent nervule, and in the median being three-branched. May not *dilucidalis* be an American species? I cannot determine the question, as M. Guenée's description is imperfect, from the fact that it was drawn from badly preserved specimens.

C. fulicalis.—Fore wings white, fuscous at the costal portion of the base, with a broad band near the base and a narrow wavy fuscous line crossing the middle of the disk, sending from the median nervure a curved line to the inner margin, convex exteriorly. The space between these lines is frequently dusted with fuscous. From an elongated fuscous patch limited below by the subcostal nervure, on the middle of the costa, departs an oblique ochreous band, inclined to the inner angle and margined along the discal nervure on both sides, with fuscous; and from the posterior end of the costal patch, a curved line joins the external dark margin of the band enclosing an oval spot of the general hue. A subterminal band tapers to the inner angle, leaving on each side of it two converging tapering bands of the general hue. Hinder margin ochreous, margined internally with fuscous. Hind wings white, with

a broad fuscous band near the base, corresponding to that on the anterior, and touched with ochreous in its middle; with a median yellowish brown curved line, not reaching the costa, and exterior to this, the apical half of the wing is dusted slightly with dark brownish. Along the terminal margin, is a row of five black lunules, connected by *intermediate metallic violet-blue spots*, and on the extreme margin behind these latter spots, *a row of orange yellow dots*; while the band is tinted interiorly with the same hue, limited by an interrupted slender dark brown line near the band.

Pennsylvania, Easton.

In ornamentation the following species is very like the foregoing. It differs from it structurally in the following respects: Fore wings with the first subcosto-marginal and medio-posterior opposite at their origins; the second marginal arises at the angle of the disk; the apical vein forked at about its middle, the lower branch entering the costa before the tip. In the hind wings the costal has a long fork; the intercostal joins the subcostal at the point of departure of the discal and seems to be a continuation of it, and the subcostal is continued to the base of the wing. *Head with ocelli*. Tongue as long as the thorax beneath. The first joint of labial palpi thickened with scales.

C. ? helopalisis.—Fore wings white, dusted with pale fuscous toward the base, and on the fold behind; with a narrow fuscous band crossing the base of the disk. Near the end of the disk is a yellowish brown line, crossing the wing, deeply and acutely angulated on the fold; and near the tip are two narrow oblique streaks of the same hue converging to the inner margin above the angle, the first of which is recurved toward the disk, encircling an obliquely placed oval spot of the general hue on the nervules behind the disk. Along the hinder margin, near the inner angle, are a few indistinct, iridescent spots: the margin and cilia yellowish brown. Hind wings white, with a short narrow fuscous band near the base, corresponding to that on the fore wings; a median line of the same hue, not attaining the exterior margin and the apical portion of the wing exterior to it sprinkled thickly with fuscous. Hinder margin with a row of black spots, having violet-blue metallic pupils and tinted with pale orange between the spots.

Lake Teedyuscong.

SIRONIA.

In the fore wings two distinct subcosto-marginal nervules leave the disk, the first and the medio-posterior opposite; the second marginal arising at a point nearly intermediate between the two hinder branches of the median; the apical vein is forked a little beyond its middle; the post apical and discocentral arise near each other on the costal side of the wing. The median is four-branched. In the hind wings the intercostal is short, remote from and exterior to the upper angle of the disk. There is nothing characteristic in the shape of the wings; the posterior are broader than the anterior.

Head with ocelli. Antennæ pubescent beneath. Labial palpi, *when undenuded*, moderately thick and squamose beneath, ascending to the middle of the front; third joint short and rather smooth; *denuded*, tapering to the tip from the base, slender and cylindrical; the basal joint long, equal to the front; the second and third short and equal in length. Maxillary palpi two-jointed, with tips nearly equal to those of the labial, ascending and somewhat tufted at the end. Tongue scaled at base, exceeding the labial palpi *by one half its length*. No abdominal apron perceptible; the length of the posterior tarsus and the tibia equal to that of the body.

S. maculalis.—Fore wings white, dusted with fuscous along the base of submedian nervure; with a fuscous spot at the base of the fold and one of the same hue in the middle of submedian interspace, and a broad, irregular band adjoining the disk behind, extended from the costa to the inner angle, with the exterior half nearly square, and the interior somewhat paler, curved

[June,

and tapering. The apex of the wing is touched with fuscous, and the ends of the nervules slightly dotted with the same hue. Hind wings concolorous, pure white.

Lake Teedyuscong. July.

Before concluding this paper, I desire to record my views respecting the unnecessary amount of labor, loss of time and uninviting study, which the details of M. Guenée's mode of systemization imposes on the American student. MM. Boisduval and Guenée, in the important and comprehensive works which engage their labors at the present time, are not writing treatises on local faunæ, but on that of the entire world, in so far at least as lepidopterous insects are known; and students everywhere have a right to expect that the difficulties of classification will be diminished, rather than complicated, by their treatment of the various groups which may be included in their works. The author who would be cosmopolitan in his representation of this subject, at the present day, cannot neglect, in justice to those who may follow his footsteps through nature, to endeavor to lighten their burden of study and to economize their time, by leading them with all the lights of his knowledge, through the complicated mazes of doubt, engendered by the numerous and perplexing affinities existing in beings of the animated world. The chief object of classification is simply to communicate our own systematic conceptions to others, and to mark the graduations in the arrangement in such a manner, as will enable them easily and quickly to recognize its groups. How has M. Guenée facilitated the recognition of genera, whilst he has greatly increased the number of them, or lightened in any respect the systematic labor of the foreign student? Is it enough that he should content himself with carefully written diagnoses, and compel the student to examine critically and minutely every one in any of his family groups, before being able to decide whether the insect he may wish to classify belongs to any of them, or is not edited? A system which both reason and convenience approves, is that which enables the student easily to find what he seeks, and not that which compels him to master the genera peculiar to every other portion of the globe, in order to assure himself whether a group has been established into which his specimens can be admitted.

The omission of synopses of genera, when the number of them in his family groups calls for such tables, as it does so frequently, is a most serious, not to say unpardonable, defect in the six volumes published by M. Guenée. There is no student of American lepidopterology, compelled to study his works, who will not regret that he has so extensively described our fauna; and the fact that so much time and patience and labor are necessary to determine whether a generic description is given by the author, of one of our moths, of which everything is unknown, perhaps, except the division to which it belongs in his system, is an actual and real impediment to the development of the study in our country. In the examination and comparison of lepidopterous insects, M. Guenée recognizes beyond doubt, each genus under a family by some distinctive structural trait, and why cannot all these be presented to the student in synopses, as well as they are apparent to his own perceptive faculties? Without these conveniences of comparative study, the student is compelled to do the work of the author anew, and, at an immense disadvantage and loss of time, to search for what is distinctive, in by no means sharply, though diffusely characterized groups, which include very frequently ornamentation as one of their chief characteristics. In the cabinet of specimens, all this is almost apparent at a glance, and it is the result of this educated sense that seizes quickly what is distinctive in a variety of forms, that the student has a right to look for in synopses.

M. Guenée expressly declares in one of his early works in the "Suites à Buffon," that in giving the meagre synopses of tribes and families, contained in the series, he is merely following the custom of M. Boisduval, and that he 1860.]

does not consider them of any value in a natural system. It seems strange that any one, especially M. Guénée, could entertain such an opinion, when a slight amount of study is sufficient to convince any naturalist, that there is no severer test to be applied to a system than the construction of synopses containing exclusive categories founded on structure. Groups agreeing most closely are brought into direct contrast, and if the most trivial and unimportant structural peculiarities, except in the case of genera, are called into requisition to distinguish them, whatever may be their comprehensiveness, is not the fact very strongly suggestive of want of naturalness, nay, of purely artificial, arbitrary distinctions, produced by the desire to create differences where there are none actually in nature? But even admitting they are formed on a purely artificial basis, and that all synopses are essentially artificial, need the fact in the character of a simple index to systematic conceptions, in any manner affect the most natural arrangement of the group in the text? And could there be any better system than that which unites the convenience of the one to the truthfulness of the other?

One of the chief objects in systematic and descriptive works certainly ought to be, a ready and certain recognition of groups and individuals; and to facilitate this, no care or labor bestowed on synopses intended to promote this object and prevent loss of time to the inquirer, can be regarded as superfluous or as a tax on authorship. The world is thus the gainer in economy of time, and science is more rapidly advanced. And surely, when one reflects how few there are who devote themselves to scientific study, the additional labor thus expended by the author carries into the future the most fruitful results. It is the neglect of the synoptical system that has converted, even at the present day, the great majority of entomologists everywhere into a class of mere collectors and picture-recognizers, and which calls for a profuseness of illustration to be met with in no other department of Natural History. And on the other hand, its tendency is to institute, if indeed it has not already done so, an Egyptian priesthood over nature, in that body of European "authorities" skilled in the interpretation of its hieroglyphics, and who furnish students with a complicated, skeleton method, all of whose details they must painfully acquire, before they can in the humblest degree, aspire to question systematic nature for themselves. How laborious, time consuming and discouraging this is to the American student, who has "no authority" to consult, save the ambiguous phrases of diagnoses, no classified collections to study, and by the comparison of forms to educate his perceptive powers in generic and family differences, cannot be appreciated by those who have all these aids, and who are the heirs to almost hereditary entomological lore and collections, handed down from one generation to another.

The times, however, demand of MM. Guénée and Boisduval a system of convenient study. The former, it is true, attempts to meet this demand by separating the portion of the order of which he treats, first, into divisions, and these into tribes, and these again into families; but scattered as they are through the body of the work, or through several volumes, this complication of arrangement is far from fulfilling the needs of the student. It is not *natural*, and is therefore perplexing, and has caused the author to mistake well marked groups within families, for families themselves, or even higher divisions. When the individual structure of two beings placed in different, sometimes widely separated families, approach so intimately that they can be distinguished only by resort to trivial characters, what more conclusive proof of artificiality, and mere brain and paper-created distinctions, can the naturalist desire?

The elaborate description of groups is a highly commendable trait in a systematic work. They should be, however, merely a confirmation of the results attainable by the study of synopses of characters, all the categories of which are rigidly exclusive and markedly characteristic of the groups they design-

[June,

nate. By this means, the question of groups having been reduced to a few which are most closely coincident, doubts which cannot be dispelled by the best synopses, are either confirmed or dissipated at once. This subject I think eminently worthy M. Guenée's consideration, and that of all systematists who may succeed him. I would beg him to think upon it in connection with his subsequent works, and at least tell students why he values less a solid and self-satisfying reputation, built on essential and successful impetus given to his favorite branch of study in all parts of the civilized world, than that ephemeral position of being the temporary authority for the little entomological world; and if in addition to synopses of all his groups, under the next most general in value, he would add to his works delineations of the distinctive parts of structure in *every genus*, instead of colored representations of a few moths, his works would possess an enduring and permanent value, so long as entomology as a study engages the attention of the student of nature.

Hemiptera of the North Pacific Exploring Expedition under Com'rs Rodgers and Ringgold.

BY P. R. UHLER.

The Hemipterous insects, brought home by the Expedition, furnish several new and remarkable species, and much praise is due the indefatigable botanist of this Expedition, Mr. Charles Wright, for displaying such zeal in bringing together so many interesting objects. The insect fauna of many of the countries touched at, particularly that of Japan, being almost entirely unknown, renders every addition of species from those localities exceedingly desirable, and it would be matter of deep interest to have an opportunity of examining full series of them.

Considering the importance of the species procured, it is much to be regretted that extensive facilities were not afforded for bringing together a general collection; but, under the existence of contingent circumstances, this was not possible.

The absence of any extensive collection of exotic *Hemiptera* in this country renders it impossible to decide with precision upon a few of the species here included; but should they hereafter be found to have been previously characterized, the proper acknowledgments will be made. As there seems to be no settled opinion in the minds of Entomologists respecting certain groups, particularly with such families as *Halydæ*, *Pentatomidæ*, *Rhaphigastridæ*, &c., and still further on, with *Mictidæ*, *Nematopidæ*, *Acanthocoridæ*, &c., and having met with a genus (*Pachycephalus*) which violates the characters of the families given, I thought it better to place the included species in two large groups (*Pentatomoidæ*, *Coreoidea*), corresponding with the genera *Pentatoma* and *Coreus*, of Fabricius.

SCUTELLERIDÆ.

CALLIDEA, Burm.

C. *Stollii*, Wolff, Icones Cimicum, 48, tab. 5, fig 45. Hong Kong.

EUCORYSSES, Amyot et Serv.

E. *superbus* ♀.—Deep orange; head bluish-black, lateral lobes and the middle one at tip sanguineous, transversely wrinkled, rostrum and antennæ black, pubescent, eyes and ocelli brownish; thorax deep orange, obsoletely punctured, a lunulate, black depression just behind the head densely, coarsely punctured, exterior and anterior edges black, spot upon the disk, one upon each humerus, and a connecting band upon the basal margin also black; behind each anterior angle is an oblong, rounded, shallow impression, blackish; corium black, punctured; wings dark-fuliginous; scutellum finely punctured, with a band at base, an irregular one dilated and projecting medially forward, 1860.]